

IN THE CLAIMS:

All of the pending claims 1-12 are set forth below. The status of each claim is indicated with one of (original), (currently amended) or (previously presented). Please AMEND claims 1, 4, 6-8, and 11 in accordance with the following:

1. (currently amended) An apparatus for authenticating a digital signature, comprising:
a signature generating part encrypting a digital document by using a private key defined by a signer and digest information for checking whether the digital document has been tampered with, and generating a digital signature;
a signature synthesizing part creating image information by synthesizing the digital signature and a predetermined mark, which enables a receiver to visually recognize a mark of the signer, wherein the digital signature is embedded in a predetermined color other than a color used for the mark of the signer in the predetermined mark; and
an image embedding part embedding the image information created by said signature synthesizing part into an indicated position in the digital document.

2. (original) The apparatus as claimed in claim 1, wherein said signature synthesizing part comprises an image information generating part generating pixel data for the image information including the digital signature,
wherein:
a palette, where first color information is defined for first index information and second color information is defined for other index information, is referred to;
the first index information is defined for pixels used for the predetermined mark; and
each of the other index information, which corresponds to each number of a number string forming the digital signature, is defined for each of other pixels.

3. (previously presented) The apparatus as claimed in claim 2, wherein said image information generating part assigns each of the other index information corresponding to each number of the number string to each pixel from a beginning of the number string forming the digital signature while skipping the pixels used for the predetermined mark.

4. (currently amended) An apparatus for authenticating a digital signature, comprising:

a signature extracting part extracting the digital signature from image information embedded into a digital document, said image information capable of showing a predetermined mark, which enables a receiver to visually recognize a mark of a signer of the digital signature, wherein the digital signature is extracted from a predetermined color other than a color used for the mark of the signer in the predetermined mark;

a digest obtaining part decrypting the digital signature by a public key opened by a signer and obtaining first digest information for checking whether the digital document has been tampered with; and

an authenticating part determining whether second digest information regenerated based on the digital document identically corresponds to the first digest information obtained by said digest obtaining part and authenticating the digital signature based on a result of the determination.

5. (previously presented) The apparatus as claimed in claim 4, wherein said signature extracting part refers to a palette where first color information is defined for first index information and second color information is defined for other index information, and defines partial pixel data, formed by removing the first index information from pixel data forming the image information, as the digital signature, so as to generate the digital signature.

6. (currently amended) A method for authenticating a digital signature, comprising :
(a) encrypting a digital document by using a private key defined by a signer and digest information for checking whether the digital document has been tampered with, and generating a digital signature;

(b) creating image information by synthesizing the digital signature and a predetermined mark, which enables a receiver to visually recognize a mark of the signer, wherein the digital signature is embedded in a predetermined color other than a color used for the mark of the signer in the predetermined mark; and

(c) embedding the image information created in said step (b) into an indicated position in the digital document.

7. (currently amended) A method for authenticating a digital signature, comprising :
(a) extracting the digital signature from image information embedded into a digital document, said image information showing a predetermined mark, which enables a receiver to visually recognize a mark of a signer of the digital signature, wherein the digital signature is

extracted from a predetermined color other than a color used for the mark of the signer in the predetermined mark;

(b) decrypting the digital signature by a public key opened by a signer and obtaining first digest information for checking whether the digital document has been tampered with; and

(c) determining whether second digest information regenerated based on the digital document identically corresponds to the first digest information and authenticating the digital signature based on a result of the determination.

8. (currently amended) A computer-readable recording medium having a program recorded therein for causing a computer to authenticate a digital signature, said program comprising the codes of:

(a) encrypting a digital document by using a private key defined by a signer and digest information for checking whether the digital document has been tampered with, and generating a digital signature;

(b) creating image information by synthesizing the digital signature and a predetermined mark, which enables a receiver to visually recognize a mark of the signer, wherein the digital signature is embedded in a predetermined color other than a color used for the mark of the signer in the predetermined mark; and

(c) embedding the image information into an indicated position in the digital document.

9. (original) The computer-readable recording medium as claimed in claim 8, wherein said code (b) includes a code of (d) generating pixel data for the image information including the digital signature,

wherein:

a palette, where first color information is defined for first index information and second color information is defined for other index information, is referred to;

the first index information is defined for pixels used for the predetermined mark; and

each of the other index information, which corresponds to each number of a number string forming the digital signature, is defined for each of other pixels.

10. (previously presented) The computer-readable recording medium as claimed in claim 9, wherein said code (d) assigns each of the other index information corresponding to each number of the number string to each pixel from a beginning of the number string forming the digital signature while skipping the pixels used for the predetermined mark.

11. (currently amended) A computer-readable recording medium having a program recorded therein for causing a computer to authenticate a digital signature, said program comprising the codes of:

(a) extracting the digital signature from image information embedded into a digital document, said image information showing a predetermined mark, which enables a receiver to visually recognize a mark of a signer of the digital signature, wherein the digital signature is extracted from a predetermined color other than a color used for the mark of the signer in the predetermined mark;

(b) decrypting the digital signature by a public key opened by a signer and obtaining first digest information for checking whether the digital document has been tampered with; and

(c) determining whether second digest information regenerated based on the digital document identically corresponds to the first digest information and authenticating the digital signature based on a result of the determination.

12. (original) The computer-readable recording medium as claimed in claim 11, wherein said signature extracting part refers to a palette where first color information is defined for first index information and second color information is defined for other index information, and defines partial pixel data, formed by removing the first index information from pixel data forming the image information, as the digital signature, so as to generate the digital signature.